In the Claims

Please replace all prior versions, and listings, of claims in the application with the following list of claims:

1-8. (Canceled)

9. (Currently amended) ~~The method of claim 8 wherein the surface comprises~~ A method of detecting sulfate comprising:

providing a sample comprising sulfate;

converting at least a portion of the sulfate to sulfur dioxide; and

continuously determining the sulfur dioxide, wherein the at least a portion of the sulfate is converted to sulfur dioxide by passing the sample over a surface comprising chromium carbide.

10. (Currently amended) ~~The method of claim 8 wherein the surface comprises~~ A method of detecting sulfate comprising:

providing a sample comprising sulfate;

converting at least a portion of the sulfate to sulfur dioxide; and

continuously determining the sulfur dioxide, wherein the at least a portion of the sulfate is converted to sulfur dioxide by passing the sample over a surface comprising a chromium salt.

11-38. (Canceled)

39. (Currently amended) ~~The method of claim 38 wherein~~ A method of detecting sulfate comprising:

passing a sample comprising sulfate over a surface, the surface comprising a transition metal and being at an elevated temperature;

reducing at least a portion of the sulfate to sulfur dioxide; and

continuously determining at least a portion of the sulfur dioxide ~~is determined~~ at a rate of more than one reading per second.

40. (Currently amended) The method of claim ~~21~~39 wherein the at least a portion of the sulfur dioxide is determined at a rate of about 10 times per second.

41-42. (Canceled)

43. (Currently amended) ~~The method of claim 21 wherein the surface comprises~~ A method of detecting sulfate comprising:

passing a sample comprising sulfate over a surface comprising chromium carbide, the surface being at an elevated temperature;

reducing at least a portion of the sulfate to sulfur dioxide; and

continuously determining at least a portion of the sulfur dioxide.

44. (Canceled)

45. (Currently amended) ~~The method of claim 21 wherein the surface comprises~~ A method of detecting sulfate comprising:

passing a sample comprising sulfate over a surface comprising a metallic chromium wool, the surface being at an elevated temperature;

reducing at least a portion of the sulfate to sulfur dioxide; and

continuously determining at least a portion of the sulfur dioxide.

46-62. (Canceled)

63. (Currently amended) ~~The method of claim 62 wherein the sulfur dioxide is determined~~ A method of detecting sulfate comprising:

passing air comprising particulate matter across a heated surface comprising chromium, the particulate matter comprising sulfate;

reducing at least a portion of the sulfate to sulfur dioxide; and

determining sulfur dioxide via a pulse fluorescence sulfur dioxide detector.

64-73. (Canceled)

74. (Currently amended) ~~The method of claim 62 wherein the surface comprises~~ A method of detecting sulfate comprising:

passing air comprising particulate matter across a heated surface comprising chromium carbide, the particulate matter comprising sulfate;

reducing at least a portion of the sulfate to sulfur dioxide; and

determining sulfur dioxide.

75-84. (Canceled)

85. (New) The method of claim 9 wherein the sulfur dioxide is determined via pulsed fluorescence detection.

86. (New) The method of claim 9 wherein determining comprises quantifying the sulfur dioxide.

87. (New) The method of claim 9 wherein at least 50% of the sulfate is converted to sulfur dioxide.

88. (New) The method of claim 9 wherein at least 90% of the sulfate is converted to sulfur dioxide.

89. (New) The method of claim 10 wherein the sulfur dioxide is determined via pulsed fluorescence detection.

90. (New) The method of claim 10 wherein determining comprises quantifying the sulfur dioxide.

91. (New) The method of claim 10 wherein at least 50% of the sulfate is converted to sulfur dioxide.

92. (New) The method of claim 10 wherein at least 90% of the sulfate is converted to sulfur dioxide.

93. (New) The method of claim 39 wherein the at least a portion of sulfur dioxide is determined via pulsed fluorescence detection.

94. (New) The method of claim 39 wherein determining comprises quantifying the at least a portion of the sulfur dioxide.

95. (New) The method of claim 39 wherein at least 50% of the sulfate is reduced to sulfur dioxide.

96. (New) The method of claim 39 wherein at least 90% of the sulfate is reduced to sulfur dioxide.

97. (New) The method of claim 43 wherein the sulfur dioxide is determined via pulsed fluorescence detection.

98. (New) The method of claim 43 wherein determining comprises quantifying the sulfur dioxide.

99. (New) The method of claim 43 wherein at least 50% of the sulfate is reduced to sulfur dioxide.

100. (New) The method of claim 43 wherein at least 90% of the sulfate is reduced to sulfur dioxide.

101. (New) The method of claim 45 wherein the sulfur dioxide is determined via pulsed fluorescence detection.

102. (New) The method of claim 45 wherein determining comprises quantifying the sulfur dioxide.

103. (New) The method of claim 45 wherein at least 50% of the sulfate is reduced to sulfur dioxide.

104. (New) The method of claim 45 wherein at least 90% of the sulfate is reduced to sulfur dioxide.

105. (New) The method of claim 63 wherein determining comprises quantifying the sulfur dioxide.

106. (New) The method of claim 63 wherein at least 50% of the sulfate is reduced to sulfur dioxide.

107. (New) The method of claim 63 wherein at least 90% of the sulfate is reduced to sulfur dioxide.

108. (New) The method of claim 63 wherein the sulfur dioxide is determined at a rate of more than one reading per minute.

109. (New) The method of claim 63 wherein the sulfur dioxide is determined continuously.

110. (New) The method of claim 63 wherein the heated surface comprises stainless steel.

111. (New) The method of claim 74 wherein determining comprises quantifying the sulfur dioxide.

112. (New) The method of claim 74 wherein at least 50% of the sulfate is reduced to sulfur dioxide.

113. (New) The method of claim 74 wherein at least 90% of the sulfate is reduced to sulfur dioxide.

114. (New) The method of claim 74 wherein the sulfur dioxide is determined at a rate of more than one reading per minute.

115. (New) The method of claim 74 wherein the sulfur dioxide is determined continuously.